

Growth of redclaw crayfish *Cherax quadricarinatus* (Von Martens 1868) (Decapoda: Parastacidae) juveniles fed isoproteic diets with partial or total substitution of fish meal by soya bean meal: preliminary study

G.M. GARCÍA-ULLOA¹, H.M. LÓPEZ-CHAVARÍN², H. RODRÍGUEZ-GONZÁLEZ³ & H. VILLARREAL-COLMENARES³

¹ Laboratorio de Ciencias Marinas, Universidad Autónoma de Guadalajara, Barra de Navidad, Jalisco, México; ² Facultad de Ciencias del Mar, Universidad de Colima, El Naranjo, Colima, México; ³ Centro de Investigaciones Biológicas del Noroeste, La Paz, Baja California Sur, México

Abstract

Growth of juvenile redclaw *Cherax quadricarinatus* fed 400 g kg⁻¹ crude protein isoproteic diets substituting fish meal with soya bean meal at various levels (250, 500, 750 and 1000 g kg⁻¹) was evaluated under laboratory conditions. Juvenile crayfish were reared individually in 1-L plastic containers for 56 days. Total survival was recorded for all treatments at the end of the experiment. There were no significant differences ($P > 0.05$) for the specific growth rate among the treatments, although the animals fed with the control diet (100% fish meal) obtained the highest mean daily weight gain (0.055 g day⁻¹), individual final weight (4.12 g), molts per individual (0.04 molts day⁻¹) and molting frequency (23.57 days) values at the end of the experiment. Dietary inclusion of soya bean meal at the tested levels hampered the *C. quadricarinatus* juvenile growth.

KEY WORDS: *Cherax quadricarinatus*, growth, isoproteic diets, soya bean meal

Received 18 May 2001, accepted 8 February 2002

Correspondence: Dr Manuel García-Ulloa Gómez, Laboratorio de Ciencias Marinas, Universidad Autónoma de Guadalajara, A.P. 3, Barra de Navidad, Jalisco, México. E-mail: turbotuag@hotmail.com

Introduction

The interest for the culture of the Australian redclaw crayfish, *Cherax quadricarinatus* (Von Martens 1868) (Decapoda: Parastacidae), is increasing in the American continent. This species has been introduced in several countries,

including the United States, Ecuador, Cuba and Mexico for commercial purposes, and is being evaluated at the experimental level in Honduras and Costa Rica (Ponce-Palafox *et al.* 1999). Such interest is based, among other factors, on several technological and biological advantages that favour its culture. For example, both larval and on-growing phases of *C. quadricarinatus* require fresh water (Arredondo-Figueroa *et al.* 1994), which saves time for acclimating when animals are transferred to grow-out ponds (Romero 1997). This crayfish tolerates wide variations for several water quality parameters, such as oxygen, ammonia, hardness, alkalinity, salinity and pH (Rouse *et al.* 1991). The redclaw is attractive in colour and form, non-aggressive compared with other species and easy to breed in captivity (Kibria *et al.* 1997).

With regard to the nutritional requirements, adult crayfish in extensive culture can be achieved with detrital food materials from plant origin (Kondos, 1990; Loya-Javellana *et al.* 1993), while inclusion of dietary animal protein is needed for juvenile stages (Jones 1995a; Anson & Rouse 1996), but as in the case of many other species in culture, a high quality supplemental feed is necessary as stocking density increases (Villarreal & Peláez 1999). There are no reports on a specific diet for this crayfish and a wide variety of food ingredients is commonly included in formulated diets (King 1993; Romero 1997; Sagi *et al.* 1997). In some cases, the reported diets used for the redclaw have been formulated for other aquatic species (Austin 1992; Barki & Karplus 2000). In Mexico, *C. quadricarinatus* farms use commercially available pelletized marine shrimp diets, which contain high levels of fish meal as the main protein source.